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SUBJECT: FOR QINGDAO, INNOVATION MEANS MONEY

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Summary

[¶](#)1. (SBU) Qingdao is a young and growing port city, with economic and science & technology (S&T) planners brimming with optimism. Local officials are promoting innovation, research and high tech development at every turn, with the primary goal being economic development rather than meeting all points of the Central Government's S&T plan. Labels of "innovative" and "high-tech" are plastered on every product and initiative, though local officials admit that much is new, not high, technology. The local government depends on larger enterprises to lead the innovation charge, while it puts local and central funding into research projects that can quickly produce marketable results. "Build it and they will come" seems to be the city's strategy as it builds, with central government approval and funding, development zones, innovation parks and a new campus for the Qingdao S&T University. U.S. business leaders operating in Qingdao highlight challenges, especially under-qualified science and engineering graduates that lack proactive and risk-taking mentality, focus too much on quantity over quality, and are more apt to steal than develop intellectual property. Local government officials, while admitting to some of these problems, did not offer any ready solutions. End summary.

Qingdao: Red Roofs, Blue Ocean and Dreams of Technology

[¶](#)2. (SBU) Qingdao is a young, cosmopolitan and growing port city getting ready to host the sailing events of the 2008 Beijing Olympics. While the red-roofed buildings and beer investment from its early 20th century German governors are key tourist attractions in this city of 7.3 million in Shandong Province, city planners have fully embraced the call to transform China into an innovation and research center by building innovation parks and a new Qingdao S&T University campus. Home to the world-renowned brands of Tsingdao Beer and Haier appliances, Qingdao is also the headquarters of the People's Liberation Army (PLA) Navy's North Fleet and numerous ocean research institutes. Qingdao's most developed high-tech industry is the electronic appliances sector. The local government's other priority development areas include biotechnology, new materials, software and marine technology. A team of Embassy ESTH, Economic and Consular officers recently visited the city to examine local S&T programs and challenges to promoting innovation, while assessing the city government's interest in hosting an American Presence Post (reftel A).

¶3. (SBU) The message emboffs heard at every stop was that innovation is the key to economic development and research must focus on developing technologies that can be commercialized. Qingdao Municipal Bureau of Science and Technology Vice Director Xu Hui stated that Qingdao follows the guidelines in the Central Government's S&T programs (reflets B and C) when they develop the equivalent in Qingdao but not strictly. The Qingdao Development and Reform Commission (QDRC) sees its main role as having changed from directing the actions of specific companies and institutions to creating an environment that is conducive to innovation, according to QDRC Deputy Director Yang Pengmin. While the QDRC previously funneled local revenue streams to state-owned enterprises (SOE), the local government is now focused on incubating small and medium-sized enterprises (SME) and helping research institutes and university research centers develop economically viable technologies.

¶4. (SBU) Qingdao officials followed the national line by stating that they are working to produce indigenous technology and innovation, while "absorbing the essence of imported technology." Overseas companies and the foreign direct investment they bring remain a key source of technology, innovation and tax revenues for Qingdao. City officials showcased the investment of Lucent and Caterpillar and then pushed emboffs to urge more U.S. firms to bring even more technology to Qingdao. This was often closely followed by a pitch from Qingdao officials for easing export controls on high tech products, either on the grounds that the controls slow China's development or that they encourage

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indigenous development of technologies by the national defense establishment, which, unable to purchase needed items from abroad, is forced to innovate and create local equivalents.

High Tech and Innovative -- Or Is It?

¶5. (SBU) The QDRC claims that the city's 665 high-tech enterprises, dealing in 1,378 information technology, new materials, marine technology and biological engineering products, were responsible for RMB 233 billion (USD 30 billion), or 44 percent of Qingdao's 2006 industrial output. However, officials also admitted that this percentage, an important index for measuring the municipal government's achievement, includes the share of not only high-tech products, but also those with "new" technology, whether high or low tech. If only "high tech" products were considered, only 10 percent of Qingdao's industrial output would be cutting edge, the QDRC Deputy Director Yang admitted.

Candle Wax, Compost and Cash Registers

¶6. (SBU) The local companies that the Qingdao economic development and S&T officials presented to emboffs dealt in new, possibly innovative, but not necessarily cutting edge, technology. The three Qingdao companies newly listed on Singapore and Shenzhen stock exchanges last year produced a new type of candle wax, software for tire production and a new technique for decomposing agricultural waste. During a tour of the Qingdao High Technology Development Zone, officials chose to show emboffs a SME making cash registers. While the company had sourced chips from the United States, Japan and Europe, and the automated circuit board assembly equipment was Japanese, the products, for which the company holds PRC patents, were standard cash registers.

Enterprises: Market-Focused R&D, with Eye to the S&T Plan

¶7. (SBU) Another consistent message emboffs heard was that the local government is relying on private enterprises, i.e. non-SOEs, to engage in the majority of innovation efforts, allowing the government to focus funding on institutes, research centers and high-tech SMEs. Larger enterprises are expected to fund their own R&D, as well as to team with research institutions, to produce new technologies and products demanded by the market and by the Central Government's S&T plan, according to the QDRC. Haier Electronics, Inc. R&D Promotion Division's Vice General Engineer Dr. David Lee confirmed that this is how Haier decides on how to invest in R&D. Ten percent of Haier's annual revenue of over RMB 100 billion goes into inventions and new products that can be brought to market within one year. Haier's funding of its "Long Term Technology Bank" for research into products that would enter the market in three to four years, is very limited and in some years non-existent. Haier often teams with research institutions and university research centers for this type of R&D, as well as to win centrally-funded national R&D projects.

Diminished Central Funds to SOEs.....

¶8. (C) Central government funding to state-owned and non-state-owned enterprises is steadily diminishing and being replaced with funding into the "soft environment" of basic research in the ocean studies, information technology and biotechnology, according to the QDRC. Chinese Academy of Science (CAS) Institute of Oceanology's Key Laboratory of Ocean Circulation and Wave Studies Chairman Dr. Wang Fan said his institute received RMB 100 million in total funding last year from the Ministry of Science & Technology CAS headquarters, State Ocean Administration, the People's Liberation Army and Navy, the National Natural Science Foundation, universities and companies, which is "more than enough" to fund his projects.

...and More Flexibility by Local Governments

¶9. (SBU) Within Qingdao's total R&D investment of 2.2 percent of its GDP, S&T Bureau officials said they have invested RMB 100 million in R&D projects submitted by SOE, non-state-owned enterprises, institutions or individuals in response to technology targets that are developed internally and not necessarily in line with the targets of national S&T plans. These targets are listed on the municipal government's website soliciting project submissions. Funded

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projects are selected by a "peer review" panel that consists of local experts as well as third parties, such as foreign contractors and international enterprise representatives, to cut down on local biases during the project selection process. Once project results are commercialized, the city's financial aid stops. City officials also encourage companies to seek out venture capital and to engage in public offerings.

Incentives, Incubation and Idea Percolation Schemes

¶10. (SBU) The Qingdao Municipal Government has implemented a number of incentive programs to incubate SMEs, to elicit innovative ideas and to encourage the registration of intellectual property. The 20 square-kilometer Qingdao High Technology Development Zone, boasts ultra-modern buildings and facilities, an incubation park for new ventures and a lucrative economic incentive package. Wang Jishang, Deputy Director General of the zone's Administrative Committee said tenants certified as "high tech" by this Central Government-mandated park pay nothing for the facilities, while corporate taxes are reduced from 24 percent to 7.5 percent after central and local government tax breaks.

Qingdao also offers a tax holiday, exempting companies from paying any corporate taxes for the first five years after becoming profitable.

¶11. (SBU) While in the past the development park mostly sought to attract foreign firms, the zone managers are now more focused on promoting the development of local high tech entrepreneurial ventures that incorporate managerial, engineering and manufacturing skills learned at foreign enterprises or overseas to commercialize locally developed S&T. Incubation and venture capital are seen as keys to success by the high-tech development zone managers.

¶12. (SBU) The city planners built software mansions, innovation parks and incubation centers -- and the entrepreneurs came. An "innovation square" is dedicated to returning overseas students and workers looking to establish new enterprises. A "platform" is being developed that will match SMEs with technologies from research institutes and university labs. Two thirds of the 30,000 square meter central building, originally dedicated to the zone's administration, is now 95 percent full of SMEs with total annual sales of RMB 10 million. 30 enterprises in the innovation park enjoy RMB 300 million in annual sales. The zone explored how to provide venture funding but conceded that management of venture capital is beyond their means. Instead, they refer the enterprises with the most promising technology to venture capital firms around China.

¶13. (SBU) One way that the S&T Bureau collects ideas for new technology, products and services is by using websites, radio ads and television spots to call on people to submit innovative ideas. The S&T Bureau also established an "S&T Research Intensity Fund" to develop R&D projects submitted by enterprises, industrial associations or chambers of commerce. These "soft research" efforts encourage local technical personnel to speak up with their ideas for new technologies, products and processes.

Intellectual Property: Still a Challenge, Except for Haier

¶14. (SBU) The QDRC said that of the over 8,000 patents Qingdao entities applied for last year, 16-20 percent were for inventions. Officials lament that most of these are not destined for quick commercialization, as large enterprises focus on marketing incremental changes to existing intellectual property (IP), while would-be entrepreneurs need assistance in getting the technologies from the research facility to the market. While Haier can boast that it develops 1.6 new products and applies for 2.7 new patents each day, Qingdao S&T Bureau officials know that the government needs to help and support SMEs and entrepreneurs develop and secure IP, lest they take the easier, quicker and less expensive route of stealing technology.

More Challenges: Quantity Still Beats Quality

¶15. (SBU) Qingdao S&T Bureau officials acknowledged that IP development and protection are just a few of the many barriers to success in developing a creative, innovative economy. It is clear that it is economic gains, and not scientific expansion, that the officials are looking for, as they believe that researchers need to focus more on projects that will yield marketable results. CAS Institute of

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Oceanology's Dr. Wang is concerned that the quality of the recent graduates at all levels is not keeping up with the increasing numbers being churned out. The education system needs more and newer facilities and equipment to keep up with the ever increasing numbers of students. At the same time, many of the best and brightest are not going into research as many masters and doctoral degree holders are more interested in getting the high paying private sector job than doing the

cutting edge research in national institutes. Although today's researchers are putting out far more papers with better English, there has not been much improvement in the quality of the contents, according to Dr. Wang.

Engineers Lack Free Thinking and Ethics

¶17. (SBU) The Emerson Motors Technology General Manager said it takes three years to train newly hired engineers, fresh out of universities that stifle risk-taking, to be independent thinkers, to be proactive and to trust their colleagues. Once that happens, they begin to develop engineering solutions and innovations, which are often patented under Emerson's name, with credit to the lead engineers. Some engineers and managers do not understand that taking the intellectual property (IP) owned by Emerson to another company is illegal and ethically wrong. Emerson has resorted, with success, to the local legal system to prosecute violators and set an example to others.

¶18. (SBU) The human resource manager at Caterpillar R&D in Qingdao confirmed that the lack of proactive thinking and the stealing IP are a constant challenge, even among their masters and doctoral degree holding employees that make RMB 5000 (USD 650) and RMB 8000 (USD 1040) per month, respectively. Hence, Caterpillar only conducts R&D for existing Caterpillar products in the Chinese market and does not do any outsourcing work for the U.S. headquarters.

Fewer Jobs for Returnees...

¶19. (SBU) Increasing returnees from overseas working and study tours are a bright spot, but not a panacea for the lack of qualified workers. Haier said they see returnees as having better language abilities, but this does not guarantee them a position, as experience and attitude are the key factors in hiring decisions. CAS noted that the numbers of returnees are increasing, but that they are finding fewer jobs in their specific fields. Emerson found that engineers having undergraduate or advanced degrees from overseas often still lacked the necessary innovative thinking skill sets due to the deep-rooted aversion to failure that inhibits the proactive seeking of solutions. Emerson and Caterpillar both have programs to quickly integrate new employees to rank-free group project teams that reward and give credit to individuals that bring new and practical solutions to the table.

...As Local Workers Shun Low Paying Local High Tech Firms

¶19. (SBU) Wintec, a cash register manufacturer with local patents, has 100 workers, operating in three shifts, controlling equipment that assembles circuit boards full of Japanese, EU, U.S. and locally sourced chips. These high school, vocational school and university graduates are paid RMB 1000 (USD 130) per month. A Wintec co-owner, formerly a Lucent engineer, said he is forced to fill these jobs with workers from outside Qingdao, because local workers only want jobs in the higher paying service sector or at foreign firms, local operations.

Innovation Boosting National Defense

¶20. (C) A number of the team's interlocutors proactively noted that stimulating innovation and an innovation-based economy will strengthen China's national defense capabilities. With the United States and the EU limiting exports of military goods and high technology items, China is forced to develop its own, they said. Haier has been assigned or won a number of military contracts, with the Haier representatives showing the team appliances, computers and composite materials designed to PLA specs. CAS noted that military funded projects in Qingdao are increasing, especially in ocean environment research focused on China's

coastal seas. The PLA Navy sometimes selects a specific institute for a project, but more often publicizes a list of projects, indicating which research facilities can bid on specific projects, and then awards funding following a review

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process.

¶21. (SBU) COMMENT: Despite local officials constant emphasis that innovation and high-tech play a large role in Qingdao's economic development, much would still need to be done to make this a reality. The local economy is booming, but pure innovation and cutting-edge technologies are not evident. Rather, what appears to be driving Qingdao's success is tourism and domestic and international consumer demand for inexpensive but relatively high quality electronics. Haier, the world's fourth largest whitegoods manufacturer and a lynchpin of Qingdao's economy, is regularly touted as one of the countries most innovative companies. While it sells large numbers of model varieties and earns many design patents, the little funding Haier invests in long-term R&D means it is unlikely to develop products that will change the world. Qingdao economic and S&T planners say they are making efforts to bring technologies from the lab to the market, but the local government either chose to keep those hidden or has a long way to go to see the fruits of their efforts. Despite local officials, building an infrastructure that appears conducive to innovation, and working to promote entrepreneurship, they still do not appear to have solutions to the challenges of under-qualified technical human resources, inadequate education, lack of venture capital, a risk-adverse culture and poor management of intellectual property. End comment.

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